

Pathogens associated with sugarcane (*Saccharum officinarum* L.) leaf yellowing and mosaic in Sri Lanka

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Leaf yellowing and various patterns of mosaic are common disease symptoms prevailing in sugarcane cultivations in major growing areas, Pelwatta, Sevanagala and Udawalawa in Sri Lanka. Those symptoms resemble to those caused by sugarcane yellow leaf virus (SCYLV), sugarcane mosaic virus (SCMV) and sugarcane streak mosaic virus (SCSMV) reported from other countries. In 2013, we observed previously unreported symptom, yellowing of midrib followed by yellowing of entire leaf lamina from Pelwatta and Udawalawa sugarcane cultivations. Present study was aimed to identify pathogens responsible for leaf yellowing and mosaic diseases in sugarcane using polymerase chain reaction (PCR). Total RNA and genomic DNA from symptomatic tissues were extracted following TRIzolTM, silica-based extraction and CTAB methods respectively with slight modifications. RNA was amplified with primers for capsid protein gene for SCYLV, SCMV and universal primers for SCSMV (CPF/AP3) using one-step reverse transcription (RT) PCR and confirmed by two-step RT-PCR. For the detection of phytoplasma associated with disease symptoms, genomic DNA was amplified using P1/P7 and PC399/P1694 primers in nested PCR. PCR products with expected size (~500 bp) was obtained only for samples showing light green streak mosaic pattern from Udawalawa. Nucleotide sequences of amplicons were 97-99% identical to SCSMV accessions in the GenBank and was named as SCSMV isolate SRI-SL1 and submitted to GenBank under the accession number MK994186. Briefly, all complete genome sequences of SCSMV in the NCBI database was aligned with SRI-SL1 sequence using ClustalW and phylogenetic tree was generated with 1000 bootstrap replicates using Geneious R11 software. The results showed that Sri Lankan isolate clusters with isolates from India, Iran and Pakistan. Our results confirm that the symptom of light green streak mosaic in sugarcane is caused by SCSMV. Further, phytoplasma are not associated with sugarcane leaf yellowing and mosaic. However, association of SCYLV and SCMV with above symptoms requires further investigation.

Keywords: sugarcane, yellow leaf, mosaic and RT-PCR

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